

An unusual case of peripheral vestibular disease in a cat following ear cleaning

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Abstract — The occurrence of vestibular disease in a cat following a wellness/vaccination visit which included routine ear cleaning is described. The cat recovered in 10 days following supportive therapy. The cause of vestibular disease was not identified but sensitivity to an ear cleaning solution or subclinical ear disease may have played a role.

Résumé — **Maladie vestibulaire périphérique inhabituelle chez un chat après un nettoyage d'oreilles.** Le présent rapport de cas décrit l'occurrence d'une maladie vestibulaire chez un chat après une visite pour examen de santé et vaccination qui incluait le nettoyage routinier des oreilles. Le chat s'est rétabli dans un délai de 10 jours après une thérapie de soutien. La cause de la maladie vestibulaire n'a pas été identifiée, mais la sensibilité à une solution de nettoyage des oreilles ou une maladie subclinique de l'oreille peut avoir joué un rôle.

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A 9-year-old neutered male domestic shorthaired cat was presented with acute onset of anorexia and ataxia 1 d after a routine wellness vaccination appointment. The patient was febrile (40.1°C), but bright, alert, and responsive. Neurological examination revealed ataxia, wide side-to-side head movements, and repeated falling to either side (in the absence of a head tilt and nystagmus). The remainder of the neurological examination was normal. No abnormal findings were noted on full physical examination, and both ear canals, pinnae, and tympanic membranes were normal on otoscopic examination.

During the previous visit, a day earlier, the patient was vaccinated for herpesvirus, calicivirus, panleukopenia virus, feline leukemia virus (ULTRA Fel-O-Vax FVRCP and FeLV, Boehringer Ingelheim, Burlington, Ontario) and rabies virus (PUREVAX® Feline Rabies, Merial, Baie D'Urfé, Quebec), and the ears were cleaned with Oti-Scrub Foaming Ear Cleanser (Pro Concepts Animal Health, Mississauga, Ontario). An adverse vaccine reaction and peripheral bilateral vestibular syndrome were suspected for the fever and the vestibular signs, respectively. Due to financial constraints, the owner elected treatment based

on the presumptive diagnosis without further diagnostics. The patient was given a single dose of cefovecin sodium (Convenia, 80 mg/mL; Zoetis, Kirkland, Quebec), 8 mg/kg body weight (BW), IM, meloxicam (Metacam 5 mg/mL; Boehringer-Ingelheim), 0.2 mg/kg BW, IM, and pyrilamine maleate and ephedrine hydrochloride (Antihistamine; Vétoquinol, Lavaltrie, Quebec), 0.5 mL/10 kg BW, IM.

Three days after treatment, the patient was no longer febrile, but was mildly dehydrated and vestibular signs persisted with a modest improvement. Bulla radiographs were taken to evaluate possible evidence of the most common cause of peripheral vestibular disease in dogs and cats: otitis media or otitis interna (1). The bulla radiographs were normal. Supportive therapy was elected, and the patient was sent home after treatment with 0.9% NaCl (Baxter, Mississauga, Ontario), SQ, and Multiwave Locked System (MLS) laser therapy (Cutting Edge Laser Technologies) on both ear canals at a chronic inflammation setting for a small scanning area. Ten days later the patient was rechecked and all vestibular signs had resolved.

Discussion

The vestibular signs presented in this case are a typical presentation of bilateral peripheral vestibular disease (1). Peripheral vestibular disease is associated with numerous disorders, but otitis media and/or otitis interna and idiopathic disease are the 2 major causes (1). The present case was unusual given that the patient had been healthy and the otoscopic examination and bulla radiography showed no abnormalities. Vaccine-associated adverse events have been well-documented in the literature, but vestibular signs secondary to vaccination have not been reported (2–5). Given the large number of animals studied for vaccine-associated adverse events, it is unlikely that vestibular signs are due to vaccine reaction (4,6).

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Table 1. Compiled and categorized database gathered from case discussions from the Veterinary Information Network

Category	Sub-category
General information	Date posted, species, gender, age, reason for visit
Procedures performed	Ear flush, gentle ear cleaning, vaccination, dental, anesthesia, or sedation
Physical status of ear	Tympanic membranes before and after procedure
Concurrent ear problem	Otitis externa, otitis interna/media, or healthy ear
Time of onset	Immediately after procedure, same day, next day, more than 1 day
Specific clinical signs	Deafness, anorexia, decreased drinking, ataxia, falling to the side, nystagmus, head tilt, side-to-side head excursion, circling, wide stance, anisocoria, ptosis, protruded nictitans, enophthalmos, unspecified vestibular signs, unspecified Horner's syndrome
Recovery	Time took to recover if reported based on specific clinical signs
Ear cleaning solution and topical medication used	No sub-category

Idiopathic peripheral vestibular disease, sometimes referred to as geriatric vestibular disease in small animals, can occur in cats of any age (1,7). The incidence is reported to be higher in outdoor cats in July and August in northeastern and mid-Atlantic regions of the United States (7,8). Treatment is often supportive and symptomatic therapy usually results in improvement within 3 to 5 d with resolution of nystagmus and with the remaining clinical signs resolving over 3 to 4 wk with occasional residual head tilt (1,9).

The cause of vestibular signs in this patient is unknown, but it is presumed to be associated with the ear cleaning which preceded the vestibular signs. Known ototoxic compounds include oral and/or topical medications including antibiotics (aminoglycosides), diuretics (furosemide), anti-neoplastic agent (cisplatin), salicylates, and detergents such as chlorhexidine (10–13). The ear cleaning solution used for this patient (water, cocomidopropyl betaine, PEG-60 almond glycerides, mackalene 426) does not contain any substances reported to be ototoxic, but the patient may have been sensitive to 1 or more of these compounds.

Cats may have sensitive ears that may predispose them to be more susceptible to ototoxic substances. The cat's ventral bulla is divided into 2 compartments by an incomplete septum, and the branch of the sympathetic nerve that runs through the septum is susceptible to injury during ear cleaning (14,15). The lack of elastin fiber in tympanic membranes may also play a role in the susceptibility to injury of cats ears during cleaning procedures (16). Cats can have otitis media without overt otitis externa (11). A recent study showed that middle ear disease is more common than the literature suggests, and more importantly, in a significant number of cases histologic evidence of otitis media was present in ears that were grossly normal (17).

Table 2. A summary of anecdotal evidence of acute onset of vestibular signs after ear cleaning procedures compiled from a Veterinary Information Network search

	Number of cats
Total case number	25
Mean age (median)	7.4 y (8.0 y)
Reported specific vestibular signs	
Anorexia	10/25 (40.0%)
Decreased water intake	2/24 (8.3%)
Ataxia	21/23 (91.3%)
Falling to the side	6/25 (27.3%)
Nystagmus	13/25 (52.0%)
Head tilt	14/23 (60.9%)
Side-to-side head excursion	1/22 (4.5%)
Circling	2/22 (9.1%)
Wide stance	1/21 (4.8%)
Anisocoria	11/22 (50.0%)
Ptosis	1/21 (4.8%)
Elevated nictitans	6/22 (27.3%)
Enophthalmos	1/21 (4.8%)
Deafness	4/24 (16.7%)
Onset of the clinical signs since the procedures	
Immediately	4/25 (16.0%)
Less than 24 h	22/25 (88.0%)
Greater than 24 h	3/25 (12.0%)
Time taken for improvement or resolution of the vestibular signs among specified cases ^a	
	1 week 4 weeks
Ataxia	2/3 3/3
Nystagmus	4/7 6/7
(unspecified) Vestibular signs ^b	4/7 6/7
(unspecified) Horner's syndrome ^c	1/1 1/1

^a Not all discussions had a follow-up on the patient's recovery.

^{b,c} Number of case discussions that reported improved vestibular signs or Horner's syndrome without mentioning the specific clinical signs.

Although otitis in small animals is relatively common, it appears that ototoxicity has received little attention in the veterinary literature, particularly in the context of ear cleaning. No literature was found that documented the specific vestibular signs or the prognosis in cases other than those involving known ototoxic agents in patients with ruptured tympanic membranes or concurrent ear disease. However, there are numerous anecdotal reports on the Veterinary Information Network (VIN) indicating a possible direct association between peripheral vestibular syndrome and routine ear cleaning. A search of the VIN website (<http://www.vin.com>) with keywords "vestibular and ear cleaning" sorted by relevance, identified discussions that involve sudden onset of vestibular syndrome following ear cleaning in cats and dogs.

A total of 101 cases from the search were reviewed to evaluate a possible association between peripheral vestibular syndrome and routine ear cleaning. Out of 101 case discussions, 25 cases involved cats with no evidence of otitis externa and intact tympanic membranes bilaterally in otoscopic examination. The information collected is summarized in Tables 1 and 2.

In this case, due to financial constraints, additional diagnostics were not performed for a definitive diagnosis of feline idiopathic vestibular disease. Despite the present case work-up, the age of patient, and recent literature findings suggest that the patient may have had subclinical ear disease not noted on

examination; this could have been exacerbated by the ear cleaning procedures (11,17). Ear cleaning is often a part of a veterinarian's routine wellness appointment. The observations made herein suggest that vestibular disease can be a consequence of routine ear cleaning procedures. Extra caution is recommended in patients with concurrent otitis externa, and the risk of this procedure should be fully communicated to clients. Further prospective studies could help determine the prevalence of complications and risk factors associated with ear cleaning in cats and dogs.

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References

1. Rossmeisl JH, Jr. Vestibular disease in dogs and cats. *Vet Clin North Am Small Anim Pract* 2010;40:81–100.
2. Moore GE, Guptill LF, Ward MP, et al. Adverse events diagnosed within three days of vaccine administration in dogs. *J Am Vet Med Assoc* 2005; 227:1102–1108.
3. Moore GE, HogenEsch H. Adverse vaccinal events in dogs and cats. *Vet Clin North Am Small Anim Pract* 2010;40:393–407.
4. Scherk MA, Ford RB, Gaskell RM, et al. 2013 AAEP Feline Vaccination Advisory Panel Report. *J Feline Med Surg* 2014;16:66.
5. Welborn LV, DeVries JG, Ford R, et al. 2011 AAHA Canine Vaccination Guidelines. *J Am Anim Hosp Assoc* 2011;47:1–42.
6. Moore GE, DeSantis-Kerr AC, Guptill LF, Glickman NW, Lewis HB, Glickman LT. Adverse events after vaccine administration in cats: 2560 cases (2002–2005). *J Am Vet Med Assoc* 2007;231:94–100.
7. Burke EE, Moise NS, de Lahunta A, Erb HN. Review of idiopathic feline vestibular syndrome in 75 cats. *J Am Vet Med Assoc* 1985; 187:941–943.
8. Thomas WB. Vestibular dysfunction. *Vet Clin North Am Small Anim Pract* 2000;30:227–249.
9. Kent M, Platt SR, Schatzberg SJ. The neurology of balance: Function and dysfunction of the vestibular system in dogs and cats. *Vet J* 2010; 185:247–258.
10. Rosychuk RAW, Merchant SR, Merchant SR. Ototoxicity. *Vet Clin North Am Small Anim Pract* 1994;24:971–980.
11. Kennis RA. Feline otitis: Diagnosis and treatment. *Vet Clin North Am Small Anim Pract* 2013;43:51–56.
12. Harvey R. Use of topical ear cleaners in small animals. In *Practice* 2006;28:131–135.
13. Oishi N, Talaska AE, Schacht J. Ototoxicity in dogs and cats. *Vet Clin North Am Small Anim Pract* 2012;42:1259–1271.
14. LeCouteur RA, Vernau KM. Feline vestibular disorders. Part I: Anatomy and clinical signs. *J Feline Med Surg* 1999;1:71–80.
15. Barlow CM, Root WS. The ocular sympathetic path between the superior cervical ganglion and the orbit in the cat. *J Comp Neurol* 1949; 91:195–207.
16. Chole RA, Kodama K. Comparative histology of the tympanic membrane and its relationship to cholesteatoma. *Ann Otol Rhinol Laryngol Suppl* 1989;98:761–766.
17. Sula MM, Njaa BL, Payton ME. Histologic characterization of the cat middle ear: In sickness and in health. *Vet Pathol* 2014;51:951–967.